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ABSTRACT

Arguing for a leadership role for Virginia's community colleges in the state's economic development, this paper describes the efforts of the Virginia Community College System (VCCS) and the Center for Innovative Technology (CIT) to meet the changing technological needs of business and industry. Section I provides an overview of the economic, social, and technical changes that have taken place in Virginia, suggesting that in an era of fast-paced change, community colleges can be a valuable partner with business and industry in the preparation of a trained labor force. This section also introduces a a joint CIT/VCCS Economic and Technology Development (ETD) program initiated in 1987 to encourage and facilitate existing and emerging businesses' use of the programs and services of the Commonwealth's colleges and universities. Section II discusses the traditional role of community colleges in economic development as providers of technical and industrial education and educational services to small and medium-sized businesses, while section III looks at the emerging leadership role of the colleges in economic development. This section calls for increased involvement in worker training and retraining and technology transfer. Section IV examines political considerations in gaining approval for and implementing the ETD program, while section V foresees a growing leadership role for the CIT in economic development. Concluding comments consider the forms of strategic leadership displayed in the implementation of the states technology transfer program. (AYC)

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# Technology Transfer

# in Virginia

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# Strategic Leadership Issues Involving Technology Transfer Through the Community College

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# I. INTRODUCTION

Leadership is the process of persuasion or example by which an individual or leadership team induces a group to pursue an objective held by the leader or shared by the leader and followers (Gardner, 1987). Leadership can evolve from subtle, long term influences that ultimately reach a significance that precipitates action. Even so, the leadership challenge is more difficult in this setting as compared to a dramatic or sudden incident.

To evaluate the situation today, it is necessary to look at certain conditions. During the past 50 years, more knowledge has been available than in all earlier history (Burke, 1985). Paradoxically, the need to use this knowledge to develop programs to enhance productivity in the United States has reached an unprecedented level. This is evident in a general way as names that were once considered "foreign" to us are now on the products and services used in our everyday activities. This is happening while knowledge now doubles every decade (Burke, 1985). Thus, affordable, acceptable and non-intimidating programs beyond classrooms and laboratories are needed to practically

use this knowledge. Not having this conduit is a particularly significant shortfall to most businesses.

An example of profound changes in our ability to compete in manufacturing is occurring in the Commonwealth of Virginia as evidenced by 1970 figures showing 24% of the jobs in the state in manufacturing, whereas in 1986 it had declined to 17% (DED, 1987). Further declines occurred through the first ten months of 1988 as manufacturing employment declined another 1700 jobs or 0.4% (DED, 1989).

Rapid changes have resulted in new challenges for leadership (Campbell, 1983) and risk taking is a necessary part of modification for change (Eisenstein, 1983). In an era of dramatic, fast-paced technological change, community colleges can be a valuable partner of business and industry in the preparation of a trained labor force. This partnership will mean keeping pace with change as well as advancing change through leadership for labor and industrial development (Fidler, 1982). Rapid social and technological change during this decade will require companies to have the necessary tools to survive. The community college will serve as a major resource for information and data

(Alfred, 1982). Providing economic and technology enhancement programs will utilize one of the primary attributes of the community college - flexibility. Employers will look to community colleges to provide timely programs to respond to rapidly changing information, as well as training needs. In an era of dramatic, fast-paced technological change, community colleges can be a valuable partner of business and industry with totally new support programs that include, but go far beyond, traditional services. This can happen without hampering the teaching process.

This involvement will require community colleges to keep pace with change as well as advance change through leadership. The community college must accept responsibility for meeting changes in technology and the economy (ibid).

Major changes in the American population, economy, and technology are shaping the structure and priorities of higher education and the allocation of its resources (Munger, 1985). Excerpted specifics include:

--the effect of rapidly changing technology on American industry and its competitive position.

--new interest among institutions of higher education in entering into contractual relationships.

Institutions of higher education increasingly must take the leadership in dialogue with other organizations.

Many factors may impede higher education's response to these challenges. Faculty members training in traditional disciplines, and conditioned to a reward system based on research and publications, may have difficulty with the new demands, the breakdown of old boundaries, and the re-configuration of academe.

We must enlist the support of decision makers off campus as well. In particular, the business community and local, state, and federal governments must be aware of the impact that their leadership can have in transforming our colleges and universities.

In 1984, the North Carolina Department of Community Colleges, responding to then Governor James Hunt's "planning for the year 2000" initiative prepared a comprehensive response. The AACJC Journal noted the following in reporting on this program (excerpted):

> Community colleges have historically been noted for their ability to adapt in response to the changes in society and the resulting needs of the constituencies they serve . . . North Carolina's citizens, like those in other areas, have become aware of the tremendous potential

> of small business to help a state's economy and produce jobs . . . In response to the commission's recommendations, the community college system is gearing up to be the first line of contact for business . . . It is especially important that the community college system and the university system in North Carolina work closely together to develop a comprehensive and efficient program for the entire state (Moone, Smith, Campbell, 1984).

Although this is specific to North Carolina, it is equally applicable to Virginia.

More recently, Congress enacted a law deeming technology and industrial innovation central to the economic and social well-being of citizens of the United States (PL 96-480).

In 1987, a program was begun in Virginia in order to encourage and facilitate involvement with, and use of, the Commonwealth's colleges and universities by existing and emerging businesses. This program was established as a function of the Center for Innovative Technology (CIT) and the Virginia Community College System (VCCS). The stated mission was to improve the economic performance of small and medium sized business by enhanced accessibility and greater utilization of colleges, universities, and federal and state laboratories. This was a bold initiative starting as a

three year pilot program of nine Directors of Economic and Technology Development (ETD Directors) at selected community college sites. Currently, expectations are that it will be expanded in July 1990, to a state-wide permanent program.

Both the Pilot Program and the Permanent Program have required vision, patience, and a new dimension of leadership from diverse institutions. One leadership challenge was (and is) to convince various constituencies to "buy in" on a vision or creative course of action. This is particularly significant when the results are potentially long term, but short term accountability is the norm. There is risk in being part of a new initiative. Consequently, the well-worn path is usually safe and secure. Not to be ignored, in 1987, the worth of CIT was suspect. Its leaders had come and gone and it seemed to be in disarray. Yet, by the addition of a new program, it was to be expanded even more into a multi-faceted organization impacting on national and international issues and organizations.

Consequently, a diverse coalition of leaders, without authority or mandate, appeared to pick up the cause. Various leadership styles and initiatives are

evident in the development, operation, expansion, and potential additional expansion of the Economic and Technology Development facet of CIT.

## II. THE TRADITIONAL ROLE OF COMMUNITY COLLEGES IN ECONOMIC DEVELOPMENT

Growth and innovation marked community colleges during the 1960's. It was a time when educators had dreams and took risks that they had not dared to attempt for years.

Government officials believe that economic growth is not possible without educational growth and that education is needed that provides young people with the opportunity to participate in Virginia's growing economy. The establishment of community colleges across the state provided equal access and opportunity to all areas of the state. According to Vaughan (1987) the idea that some sections of the state "have nothing to sell but a strong back" emerged into the praise of the community college for educating technicians, thus boosting industrial development.

From their earliest days community colleges have been entwined in the economics of the Commonwealth. Evolving, in some cases, from vocational/technical

centers and university branch campuses, participation in economic development activities literally predated the establishing of the formal institution. The level of involvement and the role that has been played by the various community colleges is quite varied. While all institutions have continuing education programs, the focus of each has been directed at matters significant to local needs. A large number of economic development initiatives has been established as the Virginia Community College System has clearly taken a powerful leadership role in improving the economic base.

The wisdom of community college leaders in promoting industrial training has been a key ingredient in the success that has enabled the VCCS to rise to its prominent leadership position in economic development. The willingness to conduct specialized, quality training, either on campus or on-site, has been so well received that it is now taken for granted. Furthermore, the Department of Economic Development (DED) now relies on this capability as a major selling point to businesses being recruited to the Commonwealth. In addition, DED often uses the VCCS's industrial training expertise on a contractual basis to

serve existing businesses which are expanding.

In many areas of the Commonwealth, the community college campus serves as the leading edge of economic development activities. Some of the ways this occurs are:

--provides a legitimate facility in which to house such meetings.

--provides leadership manpower and expertise.

--provides a readily available resource development base for all economic development activities such as wage surveys and data base searches.

--provides quick response media such as audiovisual and other learning resources.

The colleges continually work with the area chambers of commerce and other organizations or agencies interested in the economic development in the region. The availability of specialized education and training programs can play a deciding factor in decisions for plant expansion and/or location.

Over the years, the Virginia Community College System has achieved recognition as a model state system. To further broaden their position in economic development, in 1987, the VCCS and CIT combined forces. The purpose of this program is to improve the economic

performance of Virginia's small to medium sized businesses by expanding and enhancing the delivery of public higher education resources to these businesses. This was accomplished by providing new technologies, education and training, and business development resources through the technology transfer directors at nine community college sites throughout the state. These directors serve as a liaison between business/industry and higher education. The prompt delivery of these services can contribute to local economic growth by helping Virginia businesses improve their productivity, competitiveness and profitability.

Stated another way, the Virginia Community College System was begun to provide higher education to all persons across the state as a right, not a privilege, as had been the case in past years. Through the years, the community college has formed a solid foundation on which to develop qualified employees for the business and industrial community. Businesses and industries have come to rely on the expertise of instruction in the community colleges to provide their specific training and re-training programs, thus the community college has enhanced the economic development of the

state. Since its inception in 1966, the community college has traditionally been a resource for business and industry to use to gain technical employees, as well as gain expertise for training and re-training programs for current employees. By utilizing the resources created through the Technology Transfer program, this traditional role may be changing to include even a closer relationship between business, industry and community colleges. In today's world of constantly changing technology, all aspects of education, business and industry, and technology transfer will become a large continuous circle. Working together with pooled resources will be necessary in order to be competitive in a world which has no trade boundaries.

## III. THE EMERGING LEADERSHIP ROLE OF COMMUNITY COLLEGES IN ECONOMIC DEVELOPMENT

As discussed in Section II, the community colleges must use their successful experience in training and education for the business community as a springboard to expanded activities with business and industry. By taking a strong leadership role in economic development

in their service areas, the community colleges can generate many benefits for themselves, as well as for area businesses.

According to Dr. Dale Parnell, President of the American Association of Community and Junior Colleges (1989), there are two critical activities in which community colleges should be increasingly involved. Those activities are worker training and retraining, and technology transfer. Dr. Parnell indicated that community colleges are strategically located between research universities and businesses that are the potential users of the research. This positioning of the community college enables it to take a critical leadership role in developing programs that will assist in the technology transfer process.

Goal 4 of the AACJC 1989 Policy Agenda states that "community colleges can play a pivotal role in strengthening community life. AACJC will help colleges carry out this role by . . . helping national and state decision makers recognize community colleges as a major resource in economic development activities." (AACJC, 1989). Virginia has a fine history of training and retraining, and has developed what is becoming a

nationally renowned technology transfer program. The technology transfer program has added a dynamic dimension to the leadership position that the community colleges play. Many advantages accrue to the colleges as a result of the presence of the technology transfer program on campus.

Because of their leadership in technology transfer, the colleges are involved with business and industry in new ways. The businesses think of the colleges as more of an overall resource than just training and retraining. The additional contact with the business community significantly increases the visibility of the college within the community, thereby increasing the opportunities for college/business interaction and innovative programming.

The leadership provided by the colleges participating in the technology transfer has created the opportunity for them to have access to leading edge technology. Technology transfer directors are constantly searching for new technologies to be used by their clients, and they are very aware of the most current work being performed in various technological

fields. The directors routinely share this information with their colleagues at the college. When appropriate, the program and curriculum development staffs of the college can use this alliance to plan for the addition of curricula that will be needed in the future.

By participating in new efforts in economic development, such as technology transfer, the community college is able to enhance its leadership position in the community. The perception of the college by the economic development community as being responsive, flexible, and creative will enhance the college's image and status.

As the perception of the college as a leader in leading edge technology, and education in technical areas increases, and the technology transfer directors continue to interact with business and industry, enrollment at the college will be positively affected. Building on the college's leadership position in the community, the Directors will, in their daily contacts, uncover educational and training needs that exist in the business community. These needs are passed along to the appropriate academic personnel for follow-up.

Some will develop into courses that will ultimately translate into additional FTES for the college.

The above mentioned benefits are a direct result of increased leadership that the community college has taken in economic development. There are several other benefits that will accrue to the colleges. Several of the colleges that have technology transfer programs have received donations from technology transfer clients. Most donations have been in the form of cash contributions to the college foundation. Donations also have been in the form of equipment that will enhance the overall educational program for years. The potential for such donations is increased because of the leadership image that the technology transfer program gives the college.

Another benefit that comes to the college as a result of participation and leadership in expanded economic development activities has to do with broadening the experience base of teaching faculty. With increased interaction with the business community, there will be more opportunities for faculty to relate to business and industry. This increased interaction can be in the form of consulting to help a business solve a problem, developing and/or teaching courses for

business and industry, participating in personnel exchanges, or doing an internship with a business. In these examples, the participating faculty member expands his/her experience and will take that experience to the classroom, thus enhancing the primary educational mission of the college.

A final example of how the technology transfer program has provided leadership at the participating colleges is illustrated by the leadership the Directors themselves have provided on campus. On one campus, the establishment of the technology transfer program served as the focal point for defining how the college would relate to business and industry. The Director of the program provided the leadership for this effort. On another campus, the Director worked with a college team to provide leadership in applying process control techniques to improve retention practices. These are just two examples of how the Directors have provided unique leadership on their campuses.

## IV. STRATEGIC LEADERSHIP ISSUES INVOLVED IN IMPLEMENTING THE ECONOMIC & TECHNOLOGY DEVELOPMENT PROGRAM

"What the land-grant county agent did for the

farmer a century ago, the community college is doing for information age industrialists today" (Building Communities, p. 22). Expanding this thought to include the recent Recommendation III-6 (Toward the Year 2000, p. 22), which states, "the VCCS should work with the Center for Innovative Technology to broaden the experimental technology transfer and economic development program to include all colleges in the system and to strengthen and broaden the role of the program to include problem areas other than high tech." The VCCS and CIT have embarked on a mission to make the pilot project an expanded and permanent program. This program will assist businesses in all areas of the Commonwealth in obtaining technical data, technical information and new technologies. These will be important in helping businesses improve their economic performance, whether they use product, process, or environmental technologies.

As part of the pilot program guidelines, those in the pilot program were assigned the task of assessing the feasibility of a permanent program and, if feasible, to recommend the structure of the permanent program. Leadership for promoting a permanent program will come forth from many sources that will strengthen the endeavors.

**Political Considerations**

It was determined early in the program that success in having a permanent program was dependent not only upon achieving successful results in assisting business/industry, but in building a consensus of support with input from many diverse leaders by including them in the process.

This resolution represents the cumulative results of efforts by many leaders throughout the VCCS and demonstrates the use of consensus building as a tool in leadership.

The first reality of establishing any new program in state government is an awareness that the General Assembly is the lifeline of any endeavor through which the necessary funds flow. The second reality is that many elected and appointed officials, business leaders, and bureaucrats must be convinced to provide support and leadership in order to get a program established. The third reality is that to effectively travel this maze of bureaucracy requires a well thought out plan of action.

General Eisenhower stated that "leadership was getting people to develop a plan to allow one to get what they want" (Graham, 1989). In developing the strategic plan, and with a clear mission in mind, a series of meetings between Directors and CIT staff was initiated to draft a plan for the permanent program and to establish priorities for the program. It was determined from these meetings in the spring of 1989 that the highest priority should be given to maintaining a partnership between the VCCS and CIT. The combined leadership of both the VCCS and CIT were extremely important in the success of the pilot project and it was determined that this joint leadership would be continued in moving from the pilot stage to a permanent and expanded program. It was also determined that the combined political strength of both agencies would enhance the likelihood that the funding would be forthcoming from the General Assembly to accomplish this goal.

**Political Strategy for Acquiring Approval**

Having recognized the political considerations necessary to have a permanent program adopted with a permanent program plan agreed upon by the administering partnership, the next task is to disseminate the plan to those decision makers in order that they might place it in the CIT budget, which is a part of the Department of Education's budget, as well as give it the leadership support necessary to have it made a part of the final budget approved by the General Assembly.

There are many participants in this process and thus many forces must be contacted for support. Key among this group are the Governor, Secretary of Education, Chairman of the Senate Finance Committee, Speaker of the House, President of the Senate, Chairman of the House Appropriations Committee, Chairman of the Senate Education Committee, Chairman of the House Education Committee, Secretary of Finance, Executive Director of the State Council of Higher Education, the members of the Senate Finance Committee and the House Appropriations Committee, and last, but not least, all other members of the General Assembly.

This must be done in a period while the budget is being formulated, for an axiom of good leadership is to participate in the formulation of the budget rather than to have to react to the budget after it is drafted. This activity will be done primarily by the Chancellor of VCCS, the President of CIT, and their staffs.

While the positive aspects of the program's success must be reinforced for this final approval, the process of informing those in leadership has been an ongoing process since the inception of the program. This has been done through news releases, annual reports, an evaluation by an outside consultant, meetings with legislators, meetings with faculty, letters to the legislators from clients successfully served in their districts, and by the directors creating a positive image through leading by example in dealing with other agencies of state government.

The real job of having the program included in the budget should now be more mechanical than emotional since the program is a recognized success. The groundwork has been laid throughout the process and

there is a consensus among many leaders at all levels of the state that this program is important to Virginia's economic well being. The next task will be to monitor the Finance and Appropriations Committee to insure that the budget item remains intact.

The prospects for success are enhanced by the fact that all legislative districts in Virginia will be served by the expanded technology transfer program. This brings in the developed constituency of the leadership of the legislature. Political leadership is getting the legislators to want what you need (J. Graham, personal communication, June 22, 1989).

## V. THE EMERGING LEADERSHIP ROLE OF THE CENTER FOR INNOVATIVE TECHNOLOGY IN ECONOMIC DEVELOPMENT

The Economic and Technology Development (ETD) partnership has increased CIT credibility with local businesses. Up to this point, CIT's leadership was untested and virtually unknown. The opposite is true for the community colleges.

The Economic and Technology Development program gives results to CIT in the short-term. This is important because CIT is a long-term results type of organization, for it is in the long term where

leadership in technology will occur. To survive the critics during the fumblings of its early days, concrete results were needed quickly. The Economic and Technology Development program is doing this by providing visibility and expanded perceptions of the dimensions of CIT's technology leadership.

The ETD program demonstrated CIT's leadership in terms understandable to the general public. A one year progress report on the ETD program communicated effectively the human side of CIT programs. Part of leadership is communicating the value of what one has done in terms that constituents can understand. The success stories told in the progress report make the mystery of technology understandable and meaningful by making it easy to see the benefits for Virginia.

Much leadership rests on power . . . the ability to delivery something valued or something feared. The ETD program represents a form of completely positive power by giving small and medium sized businesses something of value at virtually no cost or risk. Thus, the ETD program expands and strengthens the foundations of CIT's technology leadership by its ability to give a vocal, underserved, economically critical group (small

business) access to business and technology solutions with a corresponding increase in their profitability and competitiveness.

Another relevant dimension of leadership is pushing those being led to new horizons . . . to stretch and grow beyond comfort zones by the customized, personalized, face-to-face approach, thereby enabling CIT to lead Virginia's small businesses into more innovative and cost-effective technology that, due to the fear of the unknown, would not be attempted (G. Calvert, personal communication, June 20, 1989).

More recently, CIT acted as a catalyst in bringing together several state agencies, a major utility, smaller electricity producers, and ETD Directors to stimulate bold initiatives for solving a major environmental problem. Without CIT leadership, no comprehensive organization existed in the Commonwealth to mobilize such divergent resources for participating in a cooperative project with state-wide scope.

Not to go unnoticed is the appointment of an ex-governor of Virginia as the current president of CIT to provide leadership. Truly, this is an astute

demonstration of political savvy by those responsible. Finally, the bold initiatives in the various programs and the dramatic visibility of the CIT Headquarters building symbolize the intended role for Virginia as both a national and international leader in the development, transfer, and application of technology. While Monticello and Mount Vernon are symbols of Virginia's past and the foundation on which our state and nation was built, the CIT building and the organization itself represent our future and will provide Virginia with technological leadership in the future.

**SUMMARY**

In summary, the strategic leadership displayed in working to implement the technology transfer program has taken many forms. It has combined the many varied leadership styles of a diversity of leaders into a unit with a mission, a consensus of opinion on how to accomplish that mission, and the necessary leadership to make it happen. It has taken autocratic, shared vision, and situational leadership styles to make this program a success. Commitment beyond themselves is an important part of life and these leaders possessed that commitment (Gardner, 1983).

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